

2/2 027

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--ARO120095

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF DIFFERENT STRUCTURES ON THE PROPERTIES OF ARTICLES MADE OF STEELS 25 AND 45 IS EXAMINED. THE STUDIES WERE CONDUCTED ON TUBING WITH DIFFERENT WALL THICKNESSES. IT IS SHOWN THAT THE MAXIMUM HARDENING IS ATTAINED FOR THE CASE WHEN THE STRUCTURE CONSISTS OF MARTENSITE WITH MINIMUM DISINTEGRATION DURING HARDENING UNDER ACTUAL COOLING CONDITIONS. DISINTEGRATION OF MARTENSITE IN THE COURSE OF ITS FORMATION MARKEDLY REDUCES STRENGTH PROPERTIES OF TUBING AND SLIGHTLY INCREASES THEIR PLASTICITY. THE APPEARANCE IN THE STRUCTURE OF THE METAL OF PRODUCTS OF INTERMEDIATE TRANSFORMATION OF AUSTENITE RETARDS THE WEAKENING ACTION OF THE TUBING MASS. THE RELATIVELY GRADUAL REDUCTION IN STRENGTH OF TUBING WITH GREATER WALL THICKNESS OCCURS UNTIL THE LAYER HARDENED DURING MARTENSITE STRUCTURES (CONTAINING NOT LESS THAN 50PERCENT MARTENSITE) OCCUPIES MORE THAN HALF THE TUBING CROSS SECTIONAL AREA. WHEN STRUCTURES IN THE INCOMPLETE HARDENING PERIOD BEGIN TO PREDOMINATE OVER THE MARTENSITE HARDENING STRUCTURES, STRENGTH PROPERTIES OF THE HARDENED TUBING AGAIN DROP OFF SHARPLY AND GRADUALLY APPROXIMATE THE PROPERTIES OF THE SAME TUBING IN THE NORMALIZED STATE.

UNCLASSIFIED

USSR

2 UDC: 621.372.413

ZUSMANOVSKIY, S. A., ZIMIN, S. F., SIMONOV, K. G.

"Coefficient of Interaction and Electronic Conductivity of a Two-Gap Resonator"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronic Technology. Scientific and Technical Collection. SHF Electronics), 1970, vyp. 1, pp 55-57 (from RZh-Radiotekhnika, No 7, Jul 70, Abstract No 7B139)

Translation: Expressions for the coefficient of interaction and the components of electronic conductivity with regard to space charge forces are given for a two-gap resonator in the case of an arbitrary phase shift for the fields in the gaps. Two-gap resonators with both plane and gridless gaps are considered. The given relationships may be used to determine the geometric dimensions of the field of interaction of a two-gap resonator which give maximum interaction for any phase shift of the fields in the gaps. Bibliography of four titles. Resumé.

1/1

UDC: 621.396.677.73

USSR

YERUKHIMOVICH, Yu. A., ZIMIN, S. N.

"An Antenna"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki,  
No 32, 1970, Soviet Patent No 284063, Class 21, filed 6 May 66, p 30

Abstract: This Author's Certificate introduces: 1. An antenna made in the form of a circular horn radiator and a reflector. As a distinguishing feature of the patent, the antenna is designed to produce a circular radiation pattern in one plane and a narrow pattern in another plane over a broad frequency band. To this end, the reflector is made in the form of a surface generated by rotating part of a parabola cut by a straight line passing through its focus, where the vertex of the reflector is located. The intersecting straight line is the axis of rotation of the given part of the parabola, and coincides with the axis of the reflector. 2. A modification of this antenna distinguished by the fact that polarization independent of the direction of emission is ensured by installing a conductor along the reflector axis with one end connected to the inner conductor of the coaxial antenna input, while the other end is connected to the vertex of the reflector.

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- 10 -

USSR

UDC: None

YERUKHIMOVICH, Yu. A., ZIMIN, S. N., and METRIKIN, A. A.

"Two-Reflector Antenna for Radio Relay Communications"

Moscow, Antenny, No. 7, 1970, pp 3-21

Abstract: The results of experimental tests on a new double reflector antenna with a shifted focal axis, designed according to recommendations of the International Radio Consultative Committee (MKKR) for radio relay lines, are presented and analyzed. A discussion is given of the basic system and characteristics of antennas of the shifted focal axis type. An expression is given for the gain factor, and the directional diagram of the antenna is plotted. Also plotted from the latter are curves showing the variation of the integral energy distribution in the E and H planes with respect to the antenna axis angle. These curves show that, within the limits of the main lobe ( $\pm 10^\circ$ ), the radiated energy in the H plane amounts to 78.4% of the total energy radiated, while in the E plane the radiated energy amounts to 56.8%. Cross-sectional diagrams of the antenna showing its structure and dimensions are given, and photographs of an elliptical reflector and the antenna itself are shown. The authors assert that the antenna has high electrical parameters despite the simplicity of its construction, and that it is

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USSR

YERUKHIMOVICH, Yu. A., et al, Antenny, No. 7, 1970. pp 3-21

valuable for satellite as well as earthbound radio relay communication. They conclude by thanking Engineer Yu. B. Buzuyev, who conducted the experimental work.

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- 55 -

Acc. Nr.: AA0040533

Ref. Code: UR 0482

USSR

UDC 621.526 JPRS 50248

CHERNUKHIN, V. SH., and ZIMIN, V. A.

"Tracking System"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 1, 1970, p 55, Author Certificate No 258421 Class 21c.

Abstract: This author certificate introduces a tracking system consisting of a comparator circuit with an alternating-voltage source, a preamplifier, a phase sensitive cascade, two identical channels consisting of an amplifier and a keying unit, a switch, a step-by-step motor, and a reducer. To eliminate interferences from the non-working switch input of the step-by-step motor, each system channel is provided with a diode rectifier, a limiting resistor, and a supplementary transistor, the emitter of which is connected to the amplifier base. The amplifier output is connected to the base of the supplementary transistor of the opposite channel by means of the diode and resistor in series.

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19750046

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UDC 621.526

CHERNUKHIN, V. SH., and ZIMIN, V. A.

"Tracking System"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 1, 1970, p 55, Author Certificate No 258421 Class 21c.

Abstract: This author certificate introduces a tracking system consisting of a comparator circuit with an alternating-voltage source, a preamplifier, a phase sensitive cascade, two identical channels consisting of an amplifier and a keying unit, a switch, a step-by-step motor, and a reducer. To eliminate interferences from the non-working switch input of the step-by-step motor, each system channel is provided with a diode rectifier, a limiting resistor, and a supplementary transistor, the emitter of which is connected to the amplifier base. The amplifier output is connected to the base of the supplementary transistor of the opposite channel by means of the diode and resistor in series.

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USSR

ALEBASTROVA, A. N., ANTONOVA, L. A., ZIMIN, V. A., LITSYN, N. M.

"One Algorithm for Preliminary Processing of Electrocardiograms"

Med. Kibernetika [Medical Cybernetics -- Collection of Works], Kiev, 1972, pp 66-74 (Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V704, by V. Mikheyev).

Translation: One possible approach to the problem of preliminary processing of electrocardiograms (EKG) is studied, based on element-by-element analysis of the waves and intervals between them. The analysis program includes a curve-smoothing algorithm, determination of levels of isolines (reading lines), investigation of periodicity, recognition of waves and comparison of data produced with the norms. To determine the level of the isolines, the ordinates of the EKG points are looked upon as values of a certain random quantity and the statistical distribution series is constructed for it. The ordinate with the greatest frequency defines the level of the  $x_0$  isoline. The positive and negative waves are read from this isoline. In order to input the EKG into a computer, the initial information, produced as an analog voltage, is converted to a digital series. For various reasons (influence of

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USSR

Alebastrova, A. N., Antonova, L. A., Zimin, V. A., Litsyn, N. M., Med. Kibernetika, Kiev, 1972, pp 66-74.

bioelectric currents, apparatus noise), the quality of recording of the EKG may be poor which, in turn, may cause incorrect recognition of elements of the cardiogram and, therefore, improper diagnosis. It is therefore quite important to eliminate "noise," i.e., to produce an EKG in pure form. Smoothing of the curve is performed in several passes. First-power errors are eliminated first. If point  $(x_i, t_i)$  is erroneous, the new value of ordinate  $x_i$  is assumed equal to the value of the ordinate in the preceding point  $\bar{x}_i = x_{i-1}$ . In the next stage, second power errors are eliminated, and it is assumed that  $\bar{x}_{i+1} = \bar{x}_i = x_{i+1}$ . After each stage, visual observation was performed, indicating that it is sufficient to perform three or four stages of smoothing to produce a satisfactory curve. One peculiarity of the EKG curve is its periodicity. An EKG curve can be analyzed for pathology by simply checking its periodicity, without determining the characteristics of the arrhythmia. The algorithm for determination of the EKG period uses the autocorrelation function  $K_x(T)$  to calculate the degree of similarity between two neighboring sectors of the EKG. 1 table, 3 figures, 6 biblio. refs.

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JPHE 55834

28 April 1972

ZIMIN, V. I.

# CHEMICAL WEAPONS AND DEFENSE AGAINST THEM

Translation of Russian-language brochure by R. N. Starlin, V. I. Xmel'yanov, V. I. Zimin, Khimicheskoye Oruzhiye i Zashchita ot Nego, 1971, signed to press 4 March 1971, Moscow, 61 pages.

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[I - USSR - D]

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1/2 015  
UNCLASSIFIED  
TITLE--REACTIONS OF 4,TRIFLUOROMETHYLAZO,4 PRIME,AMINOBIIPHENYL -U-  
PROCESSING DATE--20NOV70  
AUTHOR--(05)--ZIMIN, V.I., RYULINA, A.I., SULTANBEKOV, D.A., BARYSHEVA,  
L.I., STODNEV, YU.N.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. ORG. KHIM. 1970, 6(4), 812-15  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY, MATERIALS  
TOPIC TAGS--FLUORINATED ORGANIC COMPOUND, BENZENE DERIVATIVE, ORGANIC AZO  
COMPOUND, DYE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3006/1276  
STEP NO--UR/0366/70/006/004/0812/0815  
CIRC ACCESSION NO--AP0134950  
UNCLASSIFIED

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 CIRE ACCESSION NO--AP0134950  
 UNCLASSIFIED  
 PROCESSING DATE--20NOV70  
 ABSTRACT/EXTRACT--(U) 67-0- ABSTRACT. COUPLING DIAZOTIZED P,F SUB3 CN:NC  
 SUB6 H SUB4 C SUB6 NH SUB2 (1) WITH 2,C SUB10 H SUB7 NH SUB2, H,C SUB6 H  
 SUB4 (NH SUB2) SUB2, H,C SUB6 H SUB4 (CH) SUB2, 2,C SUB10 H SUB7 CH,  
 1,3,INDIOLICAC, AZOTLL A, OR AZOTGL (1A) GAVE A SERIES OF LIGHT FAST  
 DYES. SIMILARLY I WAS CONDENSED WITH O,HOC SUB6 H SUB4 CHO, P,NE SUB2  
 HOC SUB6 H SUB4 CHO, 5,2,CLATHIC SUB6 H SUB3 CHO, 5,2,0 SUB2 NITROIC SUB6  
 H SUB3 CHO, 3,4,0 SUB2 NING SUB2NIC SUB6 H SUB3 CHO, 2,1,HOC SUB10 H  
 SUB8 CHO, OR 4,2,PHAN, INDIC SUB6 H SUB3 CHO TO GIVE AZONETHINES.

UNCLASSIFIED

1/2 027  
UNCLASSIFIED  
TITLE--REACTION OF TETRAFLUOROHYDRAZINE AND NITRIC OXIDE WITH OLEFINS -U-  
PROCESSING DATE--30OCT70  
AUTHOR--(04)-FOKIN, A.V., ZIMIN, V.I., STUDNEV, YU.N., KOROTKOV, V.F.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. ORG. KHIM. 1970, 6(4), 880-1  
DATE PUBLISHED--70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CONDENSATION REACTION, NITRIC OXIDE, HIGH PRESSURE EFFECT,  
OLEFIN RESIN, TETRAFLUOROHYDRAZINE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--2000/2157  
STEP NO--UR/0366/70/006/004/0880/0881  
CIRC ACCESSION NO--AP0125740  
UNCLASSIFIED

2/2 027 UNCLASSIFIED PROCESSING DATE--30OCT70  
CIRC ACCESSION NO--AP0125740  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONDENSATION OF RCH:CHR PRIME1  
WITH F SUB2 NNF SUB2-NO MIXT. UNDER PRESSURE GAVE A MIXT. OF F SUB2  
NCHRCHR PRIME1 NF SUB2, F SUB2 NCHRCHR PRIME1 N(:O)NF, AND FCHRCHR  
RPRIME1 N(:O)NF (R AND R PRIME1 GIVEN): H, H; AND H, BU. THE PRESENCE  
OF NO ACCELERATES THE REACTION. WITHOUT NO THE REACTION REQUIRES  
HIGHER TEMPS. AND PRESSURES.

UNCLASSIFIED

1/2 024  
UNCLASSIFIED  
TITLE--REACTION OF TETRAFLUOROHYDRAZINE WITH OXIMES -U- PROCESSING DATE--23OCT70  
AUTHOR--(04)-FOKIN, A.V., ZIMIN, V.I., STUDNEV, YU.N., PONSOV, M.A.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (3), 719-20  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--OXIME, HYDRAZINE COMPOUND, PYRIDINE, FREON, FLUORONITRO  
COMPOUND, FLUORINATED ORGANIC COMPOUND, CHEMICAL SYNTHESIS, CHEMICAL  
REACTION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1999/1882  
CIRC ACCESSION NO--AP0123670  
STEP NO--UR/0062/70/000/003/0719/0720  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0123670

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PASSING N SUB2 F SUB4 7-8 HR AT 80DEGREES INTO 10.6 ACETOXIME AND 9.6 G PYRIDINE IN FREON 112 GAVE AFTER TREATING THE PRODUCT WITH AQ. HCL 35PERCENT ME SUB2 C(NF SUB2) N(O): NF, B SUB30 54DEGREES, N PRIME20 SUBD, 1.3950, D PRIME20 1.325. N SUB2 F SUB4 PASSED AT 0DEGREES INTO RHO,HOC SUB6 H SUB4 NO IN CHCL SUB3 GAVE 30PERCENT RHO,HOC SUB6 H SUB4 N(O): NF, M. 83-40DEGREES, WHICH WITH ACCL GAVE IN 16 HRS. REFLUXING 45PERCENT ACETATE, M. 55-60DEGREES, B SUB1 101DEGREES. SIMILARLY WAS PREPD. MEETC(NF SUB2) N(O):NF. ONLY IN THE PRESENCE OF PYRIDINE WAS IT POSSIBLE TO ISOLATE N FLUORO DERIVS. FROM SUCH A REACTION. WHEN N SUB2 F SUB4 WAS PASSED INTO DIMETHYLGLYOXIME IN THF 4-5 HR AT 60-50DEGREES, REMOVAL OF THE SOLVENT GAVE A RATHER UNSTABLE YELLOWISH LIQ., WHICH ON BEING HEATED EVOLVED N OXIDES BUT WHOSE CHEM. COMPN. SUGGESTED THE STRUCTURE (MECN(O): NF) SUB2.

UNCLASSIFIED



Zimin, V. M.

Chemical Ind

FID  
617614

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JPRS # 61125

Translations on

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IMPLEMENTATION OF SCIENTIFIC RESEARCH IN THE CHEMICAL INDUSTRY

(Article by A. I. ~~Shchegolev~~, ~~Kashchukova~~ ~~Novosil'skiy~~, Moscow, November 1973, ~~Chemical Industry~~)

*Chemical Ind*

At a recent meeting, the Board of Directors of the Chemical Industry looked into the nature of implementing the government plan for scientific research work and use of science and technology achievements in the chemical industry.

The report on this matter was presented by V. M. Zimin, ~~Chairman~~ of the Science and Technology Branch of the Board. He noted the achievements in the chemical field in development of scientific and technological progress and the noted serious shortcoming in the implementation of the plan for introducing new technology into industry.

For the past 2 1/2 years of the current 5 years, considerable work has been done by scientific research workers, experimental construction, planning organizations, and enterprises of the chemical industry based on involving basic scientists, technological problems and introducing science and technology achievements into industry.

In 1971-1972, in enterprises of the chemical industry Board, some 1,300 new types of projects and articles were introduced, especially pure materials, and about 1,000 products were discontinued, especially pure materials and technologies not to improvement of technology. Use of new techniques output of the technical level of production. Thus the higher quality 1971. The industrial consumption per ruble of merchandise quality decreased 1.3 percent and power, 2.1 percent.

Acceleration of technological progress in this field contributed to establishing of highly efficient technological processes and methods for producing new chemical products and articles, the development of a process for making concentrated phosphoric acid from karstite phosphorites was a



USSR

UDC: 669.295

VIATKIN, I. P., ZIMIN, V. M., KUNGINA, N. I., MUSHKOV, S. V., and DZHONS, M. M.

"Lining Smelting of Briquetted Titanium Sponge"

Moscow, Tsvetnyye Metally, No 10, Oct 73, pp 41-42

Abstract: The authors study the possibility of using pressed titanium briquets without presmelting as consumable electrodes. This involved the selection of the optimal technological parameters which would ensure smelting stability. The solution of this problem would make shaped casting inexpensive. The smelting was conducted in a lined vacuum arc furnace designed by VIAM (All-Union Scientific Research Institute of Aviation Materials). The TG-100, TG-120, and TG-ChM grades of titanium sponge were used as the charging material. The sponge was pressed in the B-654 briquet press at 630 tons into briquets of 140 and 160 mm in diameter and 120 mm high. In all more than 50 smelts were conducted. It was shown that sponge quality during the smelting of briquets made from the TG-100, TG-120, and TG-ChM grades did not affect smelting. The visually observable gas generation was practically the same or significantly greater than during the smelting of monolithic electrodes. An attempt to reduce gas generation by smelting in a helium atmosphere proved unsuccessful. The pressed electrodes also need more heat than the monolithic electrodes since their thermal conductivity and density are lower. It was also shown that the use of large diameter electrodes is more advantageous. During test-

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VIATKIN, I. P., et al, Tsvetnyye Metally, No 10, Oct 73, pp 41-42

ing the obtained liquid metal was poured into forms, producing either ingots or shaped parts. Specimens were cut from these and their chemical composition and mechanical properties determined. The corrosion resistance of these specimens was determined using standard methodology in HCl gas and acid media. The corrosion rate was quite high during the first 800 hours and reached maximum at 150-200 hours. Specimens made from TG-ChM corrode more than specimens made from TG-100. As the test duration is increased, the difference in the rate of corrosion diminishes and becomes identical.

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USSR

UDC[537.226+537.311.33]:[537+535]

BUNAREV, V. I., ZIMIN, V. N., KRASOVSKIY, V. M., RYABININ, I. V., and  
TROITSKAYA, N. V.

"Structural and Electrophysical Properties of Aluminum Oxide-on-Silicon Films"

Elektron. tekhnika. Nauch.-tekhn. sb. Mikroelektronika (Electronic Engineering.  
Collection of Scientific and Technical Works on Microelectronics), 1971,  
vyp. 3(29), pp 75-79 (from RZh-Fizika, No 1, Jan 72, Abstract No 1YE1406 by  
authors)

Translation: The authors studied the structural and electrophysical properties  
of aluminum oxide films as a function of the procedures of their deposition on  
silicon, as well as the electrophysical properties of the Al-Al<sub>2</sub>O<sub>3</sub>-Si structure.

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UNCLASSIFIED PROCESSING DATE--03JUL7C  
TITLE--NEW PHOTOSTABILIZERS OF POLYOLEFINS -U-  
AUTHOR--ZIMIN, YU.B., LEVIN, P.I., MATVEYEVA, E.A., KUZNETSOV, A.A.,  
SETNIKOVA, L.P.  
COUNTRY OF INFO--USSR  
SOURCE--PLAST. MASSY 1970, (1), 20-1  
DATE PUBLISHED-----7C  
SUBJECT AREAS--CHEMISTRY, MATERIALS  
TOPIC TAGS--CHEMICAL STABILIZER, POLYETHYLENE, PHOTOEFFECT, LIGHT AGING,  
HYDROXYL RADICAL, KETONE, ORGANIC SULFUR COMPOUND, BENZENE DERIVATIVE,  
POLYMER/ULTRAVIOLET LAMP, ULTRAVIOLET POLYETHYLENE, ULTRAVIOLET POLYETHYLENE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REL/FRAME--1980/1605 STEP AC--LR/C191/7C/OC0/CC1/CC20/CO21  
CIRC ACCESSION NO--APCC45767  
UNCLASSIFIED

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Acc. Nr.

AP0049767

Abstracting Service:  
CHEMICAL ABST. 5-70

Ref. Code:

UR 0191

101351g New photostabilizers of polyolefins. Zimin, Yu. B.; Levin, P. I.; Matveeva, E. A.; Kozodoi, A. A.; Sotnikova, L. M. (USSR). *Plast. Massy* 1970, (1), 20-1 (Russ). The effects of 2-hydroxy-4-propoxyphenyl thienyl ketone (I), and 2-hydroxy-4-octyloxyphenyl thienyl ketone (II) as photostabilizers of low-d. polyethylene P 2020T (III) and high-d. polyethylene P 4020E (IV) were studied. Thus, 0.5-0.66% of I and II were added to III and IV and the polymers were aged under a FRK-2 lamp at 25°. The phys. and mech. properties of stabilized III and IV were unchanged after a 12 month exposure in the air, indicating that I and II were effective photostabilizers comparable to Benzene OA.

CKJR J TAC

REEL/FRAME  
19801685

USSR

UDC 612.112.94

ZIMIN, YU. I., Institute of Biophysics, Ministry of Health USSR

"Accelerated Migration of Lymphocytes Out of the Thymus in Stressed Rats"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Biologicheskaya, No 4, 1973, pp 517-524

Abstract: Quantitative evaluation was made of the effects of stress on the emigration of lymphocytes out of the thymus glands of ten-week-old male and female Wistar rats, 160-180 g in weight. Stress consisted of immobilization for 6 hours, or electrical stimulation for 3 hours (2,000 Hz impulses applied for 3 seconds at 1.5 min intervals, 2.5 mA). The animals were decapitated at different time intervals following stress, and the thymus glands were removed for examinations. A decrease in thymus cells was apparent within 3 hours of stress (from a normal value of  $1.0 \pm 0.05 \times 10^9$  cells/gland), and the cell number continued to decrease for at least the next 24 hrs. The boundary between the cortex and the medulla became indistinguishable histologically between the 12-24th-hrs post-stress. After electrical stress no pronounced morphological changes were apparent; however, immobilization evoked an increase in the number of cells with nuclear lysis and pyknosis (especially during the first 3 to 6 hours, the changes subsequently being less evident). There were no absolute

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USSR

ZIMIN, YU. I., Izvestiya Akademii Nauk SSSR, Seriya Biologicheskaya, No 4, 1973, pp 517-524

changes in the mitotic activity (the control mitotic index was  $7.5 \pm 0.4\%$ ), and the mean time of mitosis was 12-13 min in the control animals (and 16-17 min in immobilized rats). The control rate of emigration of lymphocytes from the thymus was  $3.5 \times 10^7$  cells/hr. In the stressed rats the rate of emigration increased by 50-80% between the 9-12 hrs after stress. After this time the rate approached normal values, and then fell to values below normal in parallel to the decrease in the death of cells. Thus, depletion of thymus cells following stress is due to enhanced migration of lymphocytes out of the thymus, decreased cell proliferation, and destruction of lymphocytes.

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1/2 024 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--DEPLETION OF THYMUS AND SPLEEN CELLS OF RATS DURING REACTION TO  
STRESS -U-  
AUTHOR--(02)-ZIMIN, YU.I., YERMOLAYEVA, N.V.  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, PROBLEMY ENDOKRINOLOGII, NO 1, 1970, PP 96-101  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--PHYSIOLOGIC STRESS, THYMUS GLAND, SPLEEN, EDEMA, HYPEREMIA,  
MITOSIS, BONE MARROW  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1998/0817 STEP NO--UR/0502/70/000/001/0096/0101  
CIRC ACCESSION NO--AP0121449  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121449

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THREE HOURS' ELECTRICAL STIMULATION OF RATS REDUCED THE NUMBER OF CELLS IN THE THYMUS AND SPLEEN. MORPHOLOGICAL STUDY OF THESE ORGANS 3 AND 6 HOURS AFTER THE START OF STIMULATION REVEALED SLIGHT EDEMA, HYPEREMIA, AND DECREASE IN MITOSIS, WHICH RETURNED TO NORMAL AFTER 9 HOURS, BUT THERE WERE NO INDICATIONS OF AN INCREASE IN THE NUMBER OF DISINTEGRATING CELLS. THE THREE HOUR'S STIMULATION INCREASED THE NUMBER LYMPHOCYTES IN BONE MARROW WHILE DECREASING THE COUNT IN THE THYMUS AND SPLEEN. THE LOSS OF CELLS FROM THE THYMUS AND SPLEEN IS ATTRIBUTED TO THE INHIBITION OF LYMPHOCYTOPOIESIS IN THESE ORGANS AND INTENSIFIED MIGRATION OF THE CELLS FROM THE EXTRAMEDULLARY SOURCES.

FACILITY: INSTITUTE OF

BIOPHYSICS, MINISTRY OF HEALTH USSR.

UNCLASSIFIED

USSR

UDC 616.438+616.441]-018.1-007.23-02:616.45-001.1/.3

~~ZIMIN~~ <sup>2</sup> Yu. I. and YERMOLAYEVA, N. V., Institute of Biophysics, Ministry of Health USSR

"Depletion of Thymus and Spleen Cells of Rats During Reaction to Stress"

Moscow, Problemy Endokrinologii, No 1, 1970, pp 96-101

Abstract: Three hours' electrical stimulation of rats reduced the number of cells in the thymus and spleen. Morphological study of these organs 3 and 6 hours after the start of stimulation revealed slight edema, hyperemia, and decrease in mitosis, which returned to normal after 9 hours, but there were no indications of an increase in the number of disintegrating cells. The three hours' stimulation increased the number of lymphocytes in bone marrow while decreasing the count in the thymus and spleen. The loss of cells from the thymus and spleen is attributed to the inhibition of lymphocytopoiesis in these organs and intensified migration of the cells from the extramedullary sources.

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Therapy

UDC 612.014.481

USSR

KOROBKINA, A. G., KOTSYUBINSKIY, N. N., and ZIMINA, E. P.

"Effect of Sigma-Aminocaproic Acid on Combined Radiation Lesions"

Moscow, Voenno-Meditsinskiy Zhurnal, No 2, 1971, pp 42-46

Abstract: Sigma-aminocaproic acid, a synthetic inhibitor of fibrinolysis, inhibits the conversion of plasminogen into plasmin, suppresses fibrinolysis, promotes better and more rapid consolidation of blood clots, and mitigates hemorrhagic phenomena. It was administered to dogs by itself or with blood transfusions and antibiotics at different times following irradiation (500r) and fracture of the femur. One group received the acid (5% solution intravenously at the rate of 0.3 g/kg), transfusion, and antibiotics during the latent period (day 1 to day 3). Another received the same treatment at the height of radiation sickness (from day 6 to day 20). A third group was given only the acid from day 1 to day 30. The results showed that the survival rate of the animals that received sigma-aminocaproic acid during the latent period was significantly higher than in the control, while the survival rate of the other two groups of animals was the same as in the control. When the acid was administered at the height of the disease, either by itself or as part of complex therapy, it aggravated the course of the combined lesions and

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USSR

KOROBKINA, A. G., et al., Voenno-Meditsinskiy Zhurnal, No 2, 1971, pp  
42-46

most of the animals died with pronounced hemorrhagic symptoms.

2/2

- 97 -

1/2 013 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--OCCURRENCE OF CHRONIC NERVOUS SYSTEM DISEASES AMONG THE URBAN  
POPULATION BY GROUPS OF PATIENTS -U-  
AUTHOR--ZIMINA, I.I.  
COUNTRY OF INFO--USSR  
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2/2 013

UNCLASSIFIED

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MOST NERVOUS SYSTEM DISEASES HAVE A PROLONGED CHRONIC COURSE. ACCORDING TO DATA PUBLISHED BY I. V. POLYAKOV, ONLY 29.8PERCENT OF THE NERVOUS SYSTEM DISEASES REGISTERED ANNUALLY FOR ADULTS WERE DIAGNOSED FOR THE FIRST TIME; THE REMAINING 70.2PERCENT WERE CHRONIC CASES. THE STUDY OF THE NUMBER AND BREAKDOWN OF THESE CHRONIC PATIENTS IS OF INTEREST FOR EFFECTIVE PLANNING OF NEUROLOGICAL SERVICES. WE WERE CONCERNED WITH THE BREAKDOWN OF CHRONIC NERVOUS SYSTEM DISEASES AMONG THE POPULATION OF YAROSLAVL'. THE STUDY WAS MADE IN THREE MEDICAL SECTORS SERVICED BY THE MEDICAL SANITARY UNIT OF A PETROLEUM REFINERY. THE RESEARCH METHOD PROVIDED FOR A THOROUGH CENSUS OF THE ENTIRE PERMANENT POPULATION IN THESE SECTORS (12,548 PERSONS) AND THE DETERMINATION PER PATIENT OF ALL CASES OF MEDICAL CONSULTATIONS, HOSPITALIZATION AND CHECK UPS FOR NERVOUS SYSTEM DISEASES FOR A 5 YEAR PERIOD (1962-1966) BY COPYING THE NECESSARY INFORMATION FROM THE BASIC RECORDS ONTO A SPECIAL STATISTICAL CARD.  
FACILITY: YAROSLAVL' MEDICAL INSTITUTE.

UNCLASSIFIED



USSR

UDC 669.187.26:669.018.298

ZIMINA, I. N., Candidate of Technical Sciences, TSVETKOVA, V. K., Candidate of Technical Sciences, TOPILIN, V. V., Candidate of Technical Sciences, STEPANOV, V. P., Candidate of Technical Sciences, and KOSHELEVA, G. F., Engineer, Central Scientific Research Institute of Ferrous Metallurgy and Elektrostal' Plant

"Structure and Properties of the EP487 Alloy of Different Smelting Methods"

Moscow, Stal', No 6, Jun 71, pp 547-549

Abstract: On the correlation basis of structures and properties of the EP487 heat-resisting alloy produced in an open-arc furnace (OF) and subjected to electroslog or vacuum arc remelting (VR), it was found that VR must be considered the optimum smelting technology of this alloy. After VR, a spotted liquation is absent in the metal, which produces a stability of mechanical properties, the impact ductility increases in the temperature interval of hot pressure treatment, the contents of lead, oxygen, hydrogen, and nonmetallic inclusions decrease, and strength and plasticity properties at room temperature improve. The process of dispersion hardening of the alloy after VR begins at a 50% higher temperature, the  $\delta$ -phase separation takes place in a smaller temperature interval (700-850°C), and the carbide phase of the type  $M_6C$  and  $1/2$

USSR

ZIMINA, L. N., et al., Stal', No 6, Jun 71, pp 547-549

the intermetallic phase  $Me_7W_6$  are present in smaller quantities than in the  
OF metal. Five illustrations, eight bibliographic references.

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USSR

UDC 669.018.85'784'781

SVESHNIKOVA, G. A., and ZIMINA, L. N., Central Scientific  
Research Institute of Ferrous Metallurgy

"Characteristics of Kh50MBVYu Alloy with Carbon and Boron"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov,  
No 8, 1970, pp 6-11

Abstract: An investigation was made of the effect of carbon and boron additions on the structure and characteristics of the KhN50MBVYu Alloy strengthened with the intermetallic compound  $\text{Ni}_3\text{Nb}$ . The investigation involved melts containing identical amounts of the basic alloying elements (15% Cr, 1% Al, 7.5% Mo; 4.8% W, 5.3% Nb, and 8% Fe) prepared in an induction furnace with a 40-kg magnesite crucible. The boron was added in the form of ferroboration and the carbon in the form of broken-up electrodes; both were put into the bath under slag for two or three minutes before the metal was poured from the furnace. The metal was poured into square-cross-section molds in ingots weighing 7 kg; the ingots were then forged at temperatures of 950-1150° C. The effect of carbon additions was studied in melts with 0.02, 0.05, 0.1, and 0.2% carbon with no boron. With the addition of 0.05% carbon, the forgeability of the alloy deteriorated

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SVESHNIKOVA, G. A., and ZIMINA, L. N., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 8, 1970, pp 6-11

and was especially poor with the additions of more than 0.1%. The effect of boron additions in amounts of 0.004, 0.009, 0.05, and 0.8% with a constant carbon content of 0.01% were then checked. With 0.05% boron, the forgeability of the alloy deteriorated considerably; nevertheless, all the samples were forged into rods 15 mm in diameter at 1160°. It is concluded that the increase in the carbon content from 0.02 to 9.2% increases the amount of the carbide phase precipitations and reduces the size of the grain, and increases the temperature of eutectic formation. It was also found that the addition of 0.0004 to 0.08% of boron increases the amount of excess phases, shrinks the grain, and leads to the formation of boride eutectics. With a concentration of up to 0.08%, the boron changes the mechanical characteristics of the alloy only slightly at 20 and 750° C and reduces the plasticity.

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USSR

UDC 669.245.001.5

ZIMINA, L. N., and DOLZHENKO, D. I.

"Influence of Iron on Properties of Type KhN67VMTYu Nickel Alloys"

Spetsial'nyye Stali i Splavy (Special Steels and Alloys -- Collection of Works), No 77, Metallurgiya Press, 1970, pp 32-42

Translation: Results are presented from a study of the influence of iron on the structure and mechanical properties of alloys in the system Ni-Cr-Mo-W-Ti-Al.

The properties of alloys were studied after hardening and aging from various temperatures, an optimal heat treatment mode was selected, and the properties in the temperature interval from -253 to +1200°C are presented. A new heat-resistant alloy, type EP677, is presented, with 7.5-10.5% Fe, for welded products, designed for brief operation at temperatures up to 800°C. 7 figures; 2 tables; 9 refs.

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USSR

UDC 669.14.018.44.047

ZIMINA, L. N., Central Scientific Research Institute of Ferrous Metallurgy  
Imeni I. P. Bardin

"Niobium in Heat-Resistant Steels and Alloys"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1972,  
pp 57-63

Abstract: The author reviewed the works of Soviet and foreign authors and concluded that Nb combined with a high percentage of Al in heat-resistant alloys increases the stability of items made of these alloys subjected to combustion products of natural gas and diesel fuel for many hours at high temperature. Structural changes occurring in the surface layers of alloys containing niobium after performing for many hours in the combustion products were less prominent than in alloys without niobium. A rational alloying of Ni-Cr-Al with molybdenum, tungsten, cobalt, and niobium makes it possible to produce alloys capable of withstanding 800-850°C for many hours. Such alloys combine good performance characteristics under extreme conditions with high plasticity and corrosion stability in gaseous media. Niobium in heat-resistant nickel alloys slows down the diffusion processes in solid solution, precipitates hardening, facilitates redistribution of

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ZIMINA, L. N., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1972, pp 57-63

alloying elements during the alloy crystallization by lowering the segregation of Mo, W, and Ti, and increases the amount of the strengthening  $\gamma'$ -phase. Niobium is present in all phases of a given alloy, makes their composition more complex, and inhibits exchange of atoms between the solid solution and individual phases. Alloys with niobium are characterized by high weldability and by the absence of cracks along the weld during fusion welding and heating of weld joints. Niobium in alloys makes it possible to produce precision castings of high quality in air.

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Welding

+1

USSR

UDC 621.774.2

MATVEYEV, Yu. M., MAKAROV, I. P., KRYUKOV, V. N., ZUBAREVA, V. A., SAMARYANOV, Yu. V., ANTIPOV, B. F., KOZLOV, D. G., and ZIMINA, N. G., Ural Scientific Research Pipe Institute, Vyksunskiy Metallurgical Plant

"Production of Furnace-Welded Pipes With Oxygen Blowing of Skelp Edges"

Moscow, Metallurg, No 1, Jan 71, pp 34-35

Abstract: The quality of furnace-welded pipe is assessed by the welded seam quality, which is a function of the chemical composition of the metal, reduction in the welding pass, heating temperature, and the finish of the edges to be welded. In order to remove the scale and preheat the metal prior to welding, the edges are blown with high-pressure air. Blowing with oxygen makes it possible to raise the temperature of the edges. Oxygen facilitates the melting of refractory oxides and their removal from the surface of the skelp. The use of oxygen for blowing skelp edges on the furnace welding line of the Vyksunskiy Metallurgical Plant resulted in a marked increase in the quality of pipes. The strength of the weld in cone flaring tests was found to increase more than six-fold and the weld structure improved as well. The yearly savings with the use of oxygen on one mill was about 50,000 rubles.  
1/1



USSR

UDC 577.1:615.7/9

GUL'KO, A. G., and ZIMINA, N. I.

"Protein-Forming Function of the Liver of Rats Poisoned by the Inhalation of Hexachlorobutadiene"

V sb. Aktual'n. vopr. gigiyeny i epidemiol. (Current Problems of Hygiene and Epidemiology), Kishinev, "Kartya Moldovenyasko," 1972, pp 64-65 (from RZh-Biologicheskaya khimiya, No 11, Jun 73, Abstract No 11 F2067)

Translation: Rats were subjected to one-time poisoning with hexachlorobutadiene (I) at a threshold concentration of 0.071 (0.056-0.086) milligrams per liter for four hours and the effect of I on the liver was assessed from 3 hours to 14 days on the basis of changes in total protein and protein fractions as well as changes in SH groups in the blood serum and liver. The content of general protein declined after 7 days while the content of albumins declined after 6 hours. The content of  $\alpha_1$  and  $\alpha_2$  globulins was higher after 3 hours and returned to normal by the seventh day. The content of  $\beta$  globulins was higher after one day and returned to normal after 14 days. The content of  $\gamma$  globulins declined after 3 hours, rose again after 6 hours, declined by the end of a day and returned to normal after 3 days. The content  
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USSR

GUL'KO, A. G., . and ZIMINA, N. I., Current Problems of Hygiene and Epidemiology, Kishinev, "Kartya Moldovenyaski," 1972, pp 64-65

of SH groups in the blood serum and the liver was higher at the beginning of the experiment and returned to normal after 12 hours and 7 days respectively. The protein coefficient (albumin/globulin), which was 0.67 in the control, increased to 0.72 3 hours after the poisoning with I, declined to 0.45 after 6 hours and was somewhat higher than the control after 24 days. It was concluded that changes discovered in the proteingram are evidence of the heightened protective reaction of the organism to the toxic effect of I which affects the protein-forming function of the liver.

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USSR

UDC 621.357.3

ZIMINA, T. I., and KONDRIKOV, N. B.

"Anode Processes During the Electrolysis of Aqueous Solutions of the Salts of Diphenylacetic Acid"

Nekotoryye problemy kinetiki electrodivostok (English Version Above), Topic Books from the Dal'nevost University, Vladivostok, 1972, pp 54-59 (from Referativnyy Zhurnal -- Khimiya, No 8(II), 1973, Abstract No 81270, by L. S. Kanevskiy)

Translation: A study was made of the electro-oxidation of aqueous solutions of the potassium salt of diphenylacetic acid in conditions analogous to the electro-oxidation of sodium acetate. It was shown that the series of anions of this acid are produced at potentials more positive than the potential for the formation  $O_2$ . The anode polarization curves in solutions of the potassium salt of diphenylacetic acid are somewhat different than the analogous curves in the acetate solution. The difference lies, apparently, in the presence of weakly conducting films on the anode and in the incomplete suppression of the reaction of discharging water into the substituted salt solutions. The minimum VT [expansion unknown] of the oxygen under these conditions was about 40%.

1/1

USSR

UDC 911.3.616.9:597.6(571.18)

KORSH, P. V., RAVDONIKAS, O. V., MAL'KOV, G. B., VORONIN, Yu. K., ZIMINA, V. Ye., KOSTYUKOV, V. P., IVANOV, V. S., FEDOROVA, T. N., YEGOROVA, L. S., RUDAKOV, V. A., CHULOVSKIY, I. K., and SHAYMAN, M. S.

"On Carrier Characteristics and Contacts With Vectors of Viral and Bacterial Infections Among Omskaya Oblast Wild Animals"

V sb. Vopr. infekts. patol. (Problems of Infection Pathology -- collection of works) Vyp. 2, Omsk, 1970, pp 75-78 (from RZh-Meditsinskaya Geografiya, No 4, Apr 71, Abstract No 4.36.51)

Translation: A table is presented of species composition of oblast wild animals and their relative population by individual landscape subzones in Omskaya oblast (64 species). Transmission of infections with natural foci was established in 27 species for the following diseases: tickborne encephalitis, Omsk hemorrhagic fever, rabies, tickborne scrub fever, Q fever, tularemia, erysipelas, toxoplasmosis, and leptospirosis.

1/1

USSR

ZIMKIN, I. N., SAMOYLOVA, T. V., SMIRNOV, B. I., Physicotechnical Institute  
imeni A. F. Ioffe, Academy of Sciences of the USSR, Leningrad

"Effect of a Dislocation Array on the Parameters of the Dislocation Structure of Slip Bands in Lithium Fluoride Crystals"

Leningrad, Fizika Tverdogo Tela, Vol 14, No 6, Jun 72, pp 1831-1833

Abstract: An investigation was made of the effect which an array of dislocations has on the development of slip bands in lithium fluoride crystals; specifically, on the rate of broadening of the bands, the magnitude of the displacement, and the density of the edge and Burgers components of the dislocations, as well as their mean free path. The dislocation structure was studied by selective etching. It was found that a simple relation exists between the slip band parameters and the dislocation density. The edge dislocations in the slip bands increase with yield stress, but there is a reduction in the edge-to-Burgers component ratio.

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USSR

UDC 612.47+612.743

ZIMYIN, N. V., and PAKHOMOVA, T. G., Chair of Physiology, Leningrad Institute of Physical Culture, and Chair of Anatomy and Physiology, Kharkov Institute of Physical Culture

"Interrelation Between Hardness, Viscosity, Strength, and Bioelectrical Activity of Muscles in Man"

Leningrad, Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenova, Vol 58, No 7, 1972, pp 1,099-1,108

Abstract: Phasic muscles are less hard and more viscous than postural muscles. Muscles physically trained, especially in heavy work, display, at rest and in work, a greater hardness and a lower viscosity than untrained muscles. During sleep, muscle hardness and integrated electrical activity decrease, while viscosity increases. Maximum muscle strength is smaller immediately after awakening than prior to sleep. During heating, muscle hardness, viscosity, and strength increase at first. However, when skin temperature exceeds 38°C, viscosity increases while strength decreases. In ischemia and low arterial oxygenation, viscosity and hardness increase, while maximum strength decreases. When the muscle contracts, its integrated electrical activity is reduced in low arterial oxygenation but increased in ischemia. During static and dynamic work, both hardness and viscosity increase. During recovery, the

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USSR

ZIMKIN, N. V., and PAKHOMOVA, T. G., Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenova, Vol 58, No 7, 1972, pp 1,099-1,108

parameters return to normal at different speeds. It is suggested that muscle hardness, viscosity, and maximum strength are determined by physical and chemical alterations taking place in the muscle tissue and by impulses arriving via motoneurons and possibly also via sympathetic nerve fibers.

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USSR

UDC 612.822.3.087+616.831.073.97

~~ZIMINA, A. M.~~ Laboratory of Physiology, Leningrad Scientific Research Institute for the Evaluation of the Work Capability of and Organization of Labor of Invalids

"Criteria of Stability in Manifestations of Central Nervous System Activity in Man"

Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenova, Vol 58, No 7, 1972, pp 1,011-1,018

Abstract: By analyzing the frequency and duration of alpha waves in EEG recorded at rest and during trigger and rhythmic photostimulation of normal subjects and patients with spinal cord or brain stem injuries, two quantitative criteria -- the period constancy coefficient and the absolute shift coefficient -- of the stability of the central nervous system were established. These criteria revealed that CNS stability decreases with increasing degree of clinically manifested injury in the brain stem (except hypothalamus) and the spinal cord. They also revealed that either a decrease in the afferent input (section or blockage of afferent fibers) below the normal level or an increase (irritation from pathological foci) causes instability of cerebral function. While the control exerted by various areas is of different magnitude, all components are necessary for effective homeostatic coordination.

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USSR

ZIMKINA, T. M., and FOMICHEV, V. A.

Ul'tramyagkaya rentgenovskaya spektroskopiya (Ultrasoft X-Ray Spectroscopy),  
Leningrad, Leningrad University Press, 1971, 132 p

Translation of Foreward: The history of the development of x-ray spectroscopy is marked by two periods in which the widespread attention of physicists has been centered. The first period of expanded interest in x-ray spectra coincided with the development of views on the atomic structure; the second period is associated with the emergence of the solid state theory. This second period is also identified with the development of ultrasoft x-ray spectroscopy which held considerable advantages over short-wave x-ray spectroscopy for electron structure studies of solids. These advantages were demonstrated as early as in the thirties, but the low level of experimentation engineering at that time presented severe experimental problems which had impeded the development of ultrasoft x-ray spectroscopy. The application of highly effective ionization detectors for recording x-ray emission and the notable advancements in experimental techniques of the fifties produced a new wave of interest in ultrasoft x-ray spectroscopy. The marked progress in plasma physics and space research during the last decade promoted even greater interest in spectral studies in the area of ultrasoft x-ray emission.

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USSR

ZIMINA, T. M., and FOMICHEV, V. A., *Ultrasoft X-Ray Spectroscopy*, Leningrad University Press, 1971, 132 p

A. P. Lukirskiy and M. A. Rumsh were the first in the USSR to initiate developments in the new experimentation technology of this difficult and little-known spectral science. Their studies were the cornerstones for the development of two new trends in physics research -- ultrasoft x-ray spectroscopy and x-ray photoeffects from heavy photocathodes. A contribution of prime significance to the development of the latter was made by M. A. Rumsh, who devised a modern experimental technique for photoeffect studies in the x-ray spectral region and, together with his associates, devoted many years to studies of principles governing the extrinsic photoeffect of heavy photocathodes. A. P. Lukirskiy concentrated his efforts on designing long-wave x-ray spectrometers, modern experimental procedures for ultrasoft x-ray spectroscopy, studies of interaction of long-wave x-ray emission with matter (photoionization absorption, photoeffect reflection), and application of the above methods to electron structure studies of matter. In 1963, A. P. Lukirskiy was awarded the second prize of Leningrad State University im. A. A. Zhdanov. His work formed the basis of his doctoral dissertation and received wide acclaim and high ratings both in the USSR and abroad. A special design office for x-ray equipment initiated the serial production of the first Soviet

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USSR

ZIMKINA, T. M., and FOMICHEV, V. A., *Ultrasoft X-Ray Spectroscopy*, Leningrad, Leningrad University Press, 1971

ultralong-wave spectrometer-monochromator (RSM-500), designed by A. P. Lukirskiy. Scientific research institutes in a number of cities (Moscow, Sverdlovsk, Kiev, Tartu, Yerevan' and others) have initiated research projects based on RSM-500 spectrometers. The present book is based primarily on the results of studies on ultrasoft x-ray spectroscopy performed in the last decade at the X-Ray Laboratory, Department of Electronics of Solids, Physics Faculty, Leningrad State University im. A. A. Zhdanov. Most of these projects were carried out under the direct guidance of A. P. Lukirskiy or were based on his ideas. Due to the limited space of this rather small monograph, the authors have made no attempt to provide complete and comprehensive coverage of problems related to ultrasoft x-ray spectroscopy.

The book correlates extensive experimental data on procedures and experimental techniques in the field of long-wave x-ray emission, cites specific features in the performance of diffraction gratings and detectors, and describes emission filtration methods and the operation of unique and special spectrometers developed by A. P. Lukirskiy. The book also presents the results of new methods of electron structure studies of solids and gaseous molecular compounds. A survey of the basic results of photoionization

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USSR

ZIMKINA, T. M., and FOMICHEV, V. A., Ultrasoft X-Ray Spectroscopy, Leningrad, Leningrad University Press, 1971

absorption studies in gases and solids in the field of long-wave x-ray emission is included. The last chapter provides optical constants of solids for both soft and ultrasoft x-ray emissions. The authors thank Docent O. A. Yershov for his assistance in writing the chapter on "Optical Constants of Solids in Ultrasoft X-Ray Spectral Emission."

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USSR

ZIMKINA, T. M., and FOMICHEV, A. A.

Ul'trazhagkaya rentgenovskaya spektroskopiya (Ultrasoft X-Ray Spectroscopy),  
Leningrad, Leningrad University Press, 1971, 132 p

Translation of Introduction: Within the electromagnetic-wave scale ultrasoft x-ray emission holds a spectral region from about 15 to 200 Å. It is self-evident that these boundaries are rather arbitrary. Diffraction gratings -- the principal dispersive element -- lose their efficiency in wavelengths below 15 Å. In this range the spectral decomposition of emission takes place by natural crystals which are characteristic for soft (wavelengths 2 to 15 Å) and hard (wavelengths below 2 Å) x-ray emission. To date, there are almost no data on x-ray spectra in the wavelength region above 500 Å. Theoretically, x-ray spectra generated in the presence even of only one internal (nonvalent) atomic level molecule or solid can also exist within a longer wave region of the electromagnetic-wave scale. The ultrasoft x-ray emission region is situated between the "ordinary" x-ray and ultraviolet spectral regions requiring markedly different study methods. X-Ray spectra with natural crystals and optical spectrometers with diffraction gratings operated under normal angles of incidence of emission on the grating cannot be used for the spectral decomposition of ultralongwave emission. Prior to the 1930s this

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USSR

ZIMKINA, T. M., and fonichev, v. a., *Ultrasoft X-Ray Spectroscopy*, Leningrad, Leningrad University Press, 1971

spectral region appeared as a white spot on the electromagnetic scale. The experimental utilization of the ultrasoft emission region became possible only after it was observed that fairly low sliding angles in the x-ray spectral region may generate complete emission reflection from the surface of solids (in x-ray incidence from vacuum on the surface of a medium). In 1926 Compton and Duane showed that x-ray spectra can be produced by reflecting the emission from diffraction gratings at very small sliding incidence angles situated within the full external reflection region. In 1927 Tibo and Osgood applied dashed diffraction gratings for spectral studies of very soft x-rays. These first studies bridged the gap between the optical and x-ray regions of the spectrum. The ensuing papers on soft x-ray emission dealt with the development of methods for precision measurements of wavelengths using diffraction gratings. The subsequent decade (1933-43) is marked by a great number of studies on emission spectra of solids, primarily of light elements with atomic numbers of  $Z = 3$  to  $Z = 30$ . Some of the experiments also produced absorption spectra of these elements. The studies were conducted by Beardon, Siegbahn, Magnuson, O'Brien, Skinner, Farino, and other authors, and were concerned primarily with general properties of spectra and their wavelengths. The experimentation tech-

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USSR

ZIMKINA, T. M., and FOMICHEV, V. A., *Ultrasoft X-Ray Spectroscopy*, Leningrad, Leningrad University Press, 1971

nology of those years was far from being geared to detailed studies of intensities and fine spectral structures. The photographic methods of spectral recording by spectrographs ruled out absolute intensity measurements, while the unknown relationship between emulsion sensitivity and recorded emission wavelength hindered studies of wide spectral sectors. Moreover, the low sensitivity of even special photoemulsions to ultralongwave x-ray emission delayed the appearance of spectra to a point where the substance applied to the anode of the x-ray tube could no longer be safely preserved. Under exposure to electron bombardment, even under vacuum of the order of  $10^{-6}$  mm Hg, the test substance could undergo various processes of oxidation decomposition, contamination with carbon, tungsten oxides, etc. The low reflection factors of diffraction gratings required the use of wide-slot spectrometers which made it impossible to obtain good resolution of fine spectral structures. The spectral shapes could not be properly studied due to the lack of data on the spectral relationship between the reflection factors of the diffraction gratings and the application of short-wave emission reflected from the gratings at higher orders of diffraction. Considerable problems arose in studies of absorption spectra due to the lack of heavy-duty continuous spectral sources. In the ultrasoft region,

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USSR

ZIMKINA, T. M., and FOMICHEV, V. A., *Ultrasoft X-Ray Spectroscopy*. Leningrad, Leningrad. University. Press, 1971

bremsstrahlung appears to be of low intensity, and all studies were therefore conducted using line emission sources. The inconstancy of the relative line intensity of these sources and the application of spectra of higher orders of diffraction, not to mention the discrete spectral structure, were the principal shortcomings of these sources. Considerable interest in ultralong-wave x-ray spectroscopy arose in the 1950s with new advances in experimentation technology. In 1952, Paor and associates designed a vacuum spectrometer with a photoelectric multiplier and Cu-Be emitters which exhibited much higher sensitivity in the 100-800 Å region than that of a photoplate. In 1954 Chalklin and Rogers constructed a vacuum spectrometer with a Geiger counter to serve as a detector. The effective region of this spectrometer was 20 to 200 Å. The upper limit of the spectral region which can be picked up by such a detector is restricted by the high absorption of long-wave emission in the counter's porthole. In 1953 Tombolian and associates conducted feasibility studies on continuous electromagnetic emission produced by high-energy electrons using a synchrotron as a source for absorption spectra studies. This emission exhibits high intensity and takes up a wide portion of the spectrum. Tombolian's work holds much promise for this remarkable source in measuring absorption spectra. Significant contributions to furthering the development of techniques and

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USSR

ZIMKINA, T. M., and FOMICHEV, V. A., Ultrasoft X-Ray Spectroscopy, Leningrad, Leningrad University Press, 1971

procedures for ultralong-wave x-ray spectroscopy were made by A. P. Lukirskiy in his studies initiated at the end of the 1950s. Lukirskiy and his associates developed an improved counter, analyzed various gas mixtures (counter fillers) and determined the effectiveness of the new counter for a wide range of wavelengths (6 to 400 Å) with various gas fillers, making it possible to use the counter for absolute intensity measurements of ultralong-wave x-ray spectra. The investigators also demonstrated the potentialities of proportional counters for recording emission over a wide range of intensities. A number of studies by A. P. Lukirskiy, M. A. Rumsh et al., concern photo-voltaic detectors (secondary open-type electronic multipliers). The studies include selection of photocathode materials and a detailed analysis of the spectral curve of their quantum yield, permitting photomultiplier applications for absolute measurements. The addition of highly effective ionization and photovoltaic detectors to the spectrometer system markedly reduced spectra generation time, making it possible to lower the performance requirements on the tube and thus increase data reliability. Great importance for the development of ultrasoft x-ray spectroscopy is attached to the studies by A. P. Lukirskiy on various types of diffraction gratings and reflection coefficients from different materials in wavelengths from 7 to 200 Å. The results of these studies have

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ZIMKINA, T. M. and FOMICHEV, V. A., Ultrasoft X-Ray Spectroscopy, Leningrad, Leningrad University Press, 1971

shown that proper selection of coatings will markedly increase the reflection factor of the diffraction grating cut on glass and eliminate the fine structure in the spectral path of the grating's efficiency in the L-edge absorption region of silicon -- a component of glass ( $\lambda \approx 130 \text{ \AA}$ ). On the basis of reflection data on ultrasoft x-ray emission Lukirskiy introduced a new component into the spectrometer -- a spherical filter-reflector which eliminated a major problem in long-wave x-ray spectral studies related to application of emission reflected by the grating under various order of diffraction. When set at a specific angle relative to the incident ray, this spherical mirror reflected emission only beginning with a certain wavelength while absorbing all emissions of lower wavelengths. Changing the sliding angle permitted shifting the boundary of reflected wavelength one way or the other. The study covered various coatings for filter-reflectors to determine the optimum type -- a polystyrene coating. The significance of the filter reflector for studying x-ray spectra can scarcely be overrated, specifically for absorption spectra. The results of an entire complex of studies conducted under the guidance of Lukirskiy formed the basis of modern experimental techniques in ultralong-wave x-ray spectroscopy, made possible designs of highly effective

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ZIMKINA, T. M., and FOMICHEV, V. A., *Ultrasoft X-Ray Spectroscopy*, Leningrad, Leningrad University Press, 1971

spectrometers, and offered new, strong possibilities of using this method of investigation for studying electron structures of solids and molecular gases, principles governing both absorption and reflection of ultra-longwave x-ray emission, photoeffect regularities in low quantum energies, solution of applied problems related to the quantitative analysis of light elements, x-ray emission of the stars and the Sun, as well as problems related to high-temperature plasma. The principal advantages of ultra-soft x-ray spectroscopy in solving the above problems are as follows:

1. Within the ultrasoft x-ray spectral region, the shallow energy level width is very much smaller than those in the short-wave x-ray emission. The internal energy level width will, therefore, hardly distort the information on the electron states of solids available in the x-ray spectra. Experiments indicate that levels which produce emission in the 100 Å region have a width of 0.1 to 0.3 ev.
2. The second advantage is associated with the finite value of wave resolution  $\Delta \lambda$  for all spectral devices; recalculating this value for energy resolution is extremely useful for the ultrasoft spectral region since  $\Delta E(\text{ev})$

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ZIMKINA, T. M., and FOMICHEV, V. A., Ultrasoft X-Ray Spectroscopy, Leningrad, Leningrad University Press, 1971

$\approx (12,398 / \lambda^2) \Delta \lambda (\text{\AA})$ . In a spectral region with  $\lambda \approx 1 \text{ \AA}$ , even in devices with a resolution of  $\lambda / \Delta \lambda = 10^4$ , the energy resolution will come only to  $\Delta E = 1.2 \text{ ev}$ . On the other hand, it is possible to obtain a resolution of  $\Delta E = 0.1 \text{ ev}$  in the 100  $\text{\AA}$  region with a device having  $\lambda / \Delta \lambda = 10^3$ . Such wave resolutions are real for spectrometers with effective gratings and detectors. In this manner, in ultrasoft x-ray spectroscopy, spectra distortions introduced by both the internal level width and the finite value of instrumental resolution will be much smaller than those of the width of the spectral region under study. In many cases it will therefore not be necessary to correct spectra for the above distortions which, in turn, upgrades the accuracy of the obtained results.

3. X-ray spectra of light elements ranging from Li to F are situated in the ultrasoft-wave emission region (18-240  $\text{\AA}$ ). Hence, the study of the energy structure of such important chemical compounds as oxides, nitrides, carbides, borides and fluorides is possible only by using ultrasoft x-ray spectra.

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ZIMKINA, T. M., and FOMICHEV, V. A., Ultrasoft X-Ray Spectroscopy, Leningrad, Leningrad University Press, 1971

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ZIMKINA, T. M., and FOMICHEV, V. A., Ultrasoft X-Ray Spectroscopy, Leningrad, Leningrad University Press, 1971

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1/2 028 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--K SPECTRA OF BORON IN TRANSITION METAL DIBORIDES AND IN LAB SUB6,  
BAB SUB6, AND ASB COMPOUNDS -U-  
AUTHOR-(03)-LYAKHOVSKAYA, I.I., ZIMKINA, T.M., FOMICHEV, V.A.  
COUNTRY OF INFO--USSR  
SOURCE--FIZ. TVERD. TELA 1970, 12(1), 174-80  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY, MATERIALS, PHYSICS  
TOPIC TAGS--BORIDE, LANTHANUM COMPOUND, BARIUM COMPOUND, ARSENIC COMPOUND,  
TITANIUM CARBIDE, EMISSION SPECTRUM, TRANSMISSION METAL, ABSORPTION  
EDGE, ABSORPTION SPECTRUM  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1984/0204 STEP NO--UR/0181/70/012/001/0174/0180  
CIRC ACCESSION NO--AP0055000  
UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0055000

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. X RAY EMISSION AND PHOTOELECTRON K SPECTRA OF B IN DIBORIDES WERE OBTAINED FOR THE TRANSITION METAL DIBORIDES TIB SUB2, ZNB SUB2, HFB SUB2, AND TAB SUB2 AND FOR BAB SUB6, LAB SUB6, AND ASB. IN ALL BORIDES THE EMISSION K BANDS OF B HAVE A COMPLEX STRUCTURE AND APPROX. THE SAME SHAPE. IN THE ABSORPTION SPECTRA OF ALL BORIDES INVESTIGATED, WITH THE EXCEPTION OF ASB, IN THE REGION OF K EDGE ABSORPTION, A SHARP SELECTIVE MAX. IS OBSD. WHICH CAN APPARENTLY BE RELATED TO A TRANSITION INTO AN EXCITED STATE OF B. THE ABSORPTION EDGE IN THE K SPECTRUM OF B IS SEPD. FROM THE SHORT WAVELENGTH EMISSION EDGE BY A DISTANCE OF THE ORDER OF 3 EV FOR ALL THE BORIDES. IN THE SPECTRA OF THE METAL OF THESE SAME COMPS., THE ABSORPTION EDGE COINCIDES WITH THE SHORT WAVELENGTH EDGE OF EMISSION. THE PRESENCE OF AN ENERGY GAP IN THE SPECTRA OF B CAN BE RELATED TO THE PRESENCE OF FREE 3D STATES AT THE BOTTOM OF THE CONDUCTION BAND OF THE TRANSITION METAL. FROM COMPARISON OF THE K SPECTRA OF B WITH K AND L SUBII, III SPECTRA OF TIB SUB2, THE ENERGY DISTRIBUTION OF THE STATES OF DIFFERENT SYMMETRY IN THE VALENCE BAND AND IN THE CONDUCTION BAND OF TIB SUB2 IS DETD.

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1/2 018 UNCLASSIFIED PROCESSING DATE--19SEP70  
TITLE--X RAY SPECTRA OF BORON IN BORON NITRIDE AND BORON OXIDE -U-  
AUTHOR-(03)-FOMICHEV, V.A., ZIMKINA, T.M., LYAKHOVSKAYA, I.I.  
COUNTRY OF INFO--USSR  
SOURCE--FIZ. TVERD. TELA 1970, 12(1) 156-9  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, PHYSICS  
TOPIC TAGS--X RAY EMISSION, X RAY ANALYSIS, BORON NITRIDE, BORON OXIDE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1980/0245 STEP NO--UR/0181/70/012/001/0156/0159  
CIRC ACCESSION NO--AP0048524  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--19SEP70

CIRC ACCESSION NO--AP0048924

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. THE BEHAVIOR WAS INVESTIGATED OF  
SELECTED MAX. IN THE K SPECTRA OF B IN BN AND B SUB2 O SUB3 LOCATED AT  
THE SHORT WAVELENGTH SIDE OF THE MAIN BAND. ON VARIATION OF THE ANODE  
VOLTAGE OF THE X RAY TUBE, EMISSION SPECTRA IN THE REGION OF THE ABOVE  
MAX. FOR BN UNDERGOES VARIATIONS RELATED TO THE PRESENCE OF B SUB2 O  
SUB3 IMPURITY ON THE SURFACE OF BN. IN THE SPECTRA OF B SUB2 O SUB3  
SUCH VARIATIONS WERE NOT OBSD.

UNCLASSIFIED

USSR

UDC: 621.397.61

ZIMNEV, M. M., NEMANOV, V. S., OKMAN, A. A.

"Audio Equipment at the Soviet-Wide Television Center"

V sb. Televizion. tekhnika (Television Technology--collection of works), Moscow, "Svyaz", 1971, pp 164-181 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6G173)

Translation: The authors discuss the principal elements of the audio channel -- amplifiers, electroacoustic equipment, etc. A description is given of the main equipment in the sound studio module and the equipment of the central services -- programming unit, translating unit, video recording unit, etc. The technical characteristics of the main audio channels of the telecenter are given. Six illustrations. N. S.

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USSR

UDC: 621.314.2

ZIMODRO, A. F., SHUBIN, V. V., BOL'SHAKOVA, L. P., POZNYAK, V. I.

"Quality Control of Ferrite Cores for Pulse Microtransformers"

Elektron. tekhnika. Nauchno-tekhn. sb. Radiokomponenty (Electronic Technology. Scientific and Technical Collection. Radio Components), 1970, vyp. 1, pp 128-133 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5V368)

Translation: The authors discuss some problems of sorting out ferrite cores for pulse microtransformers. The selected method of inspection is substantiated and experimental data are presented. Resumé.

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1/2 018 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--PHOTOSENSITIVITY AND ELECTROLUMINESCENCE SPECTRA OF GAAS-IN, SUB  
X, GA, SUB I-X, AS P-N HETEROJUNCTIONS -U-  
AUTHOR--(03)-FEDOTOV, YA.A., GRATSEERSHTEYN, A.I., ZINGGORDOVA, N.S.  
COUNTRY OF INFO--USSR  
SOURCE--FIZIKA I TEKHNIKA POLUPROVODNIKOV, VOL. 4, MAY 1970, P. 980-982  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--PHOTOELECTROMOTIVE FORCE, PHOTOSENSITIVITY, GALLIUM ARSENIDE  
PN JUNCTION, LUMINESCENCE SPECTRUM  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3007/0897 STEP NO--UR/0449/70/004/000/0980/0982  
CIRC ACCESSION NO--AP0136331  
UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136331

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DETERMINATION OF THE SPECTRAL DISTRIBUTION OF THE PHOTO EMF OF GAAS-INISUB XIGA(SUB 1-X)AS P-N HETEROJUNCTIONS AT ROOM TEMPERATURE. IT IS SHOWN THAT A REGULAR CHANGE IN THE PHOTOSENSITIVITY CHARACTERISTICS OCCURS WITH A CHANGE IN THE COMPOSITION OF THE JUNCTIONS. IN ADDITION TO THE MAIN MAXIMUM AT 1.42 EV, DUE TO INTRINSIC ABSORPTION IN GALLIUM ARSENIDE, A SECOND PHOTOSENSITIVITY MAXIMUM OCCURS IN THE VICINITY OF 1.32 EV. WITH AN INCREASE IN THE INDIUM CONTENT IN THE SOLID SOLUTION LAYER THE INTENSITY OF THIS PEAK INCREASES AND THE INTENSITY OF THE PEAK ASSOCIATED WITH THE INTRINSIC ABSORPTION DECREASES. FACILITY: MOSKOVSKII INSTITUT STALI I SPLAVOV, MOSCOW, USSR.

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Acc. Nr.: AP0045044

Ref. Code: UR 0000

USSR

UDC 621.382:535.376 <sup>JPRS 5248</sup>

ALFEROV, ZH. I., GAMAZOV, A. A., ZIMOGOROVA, N. S., and PROTASOV, I. I.

"Photo Elements and Emitter Diodes on the Basis of Epitaxial Structures with Homo- and Heterojunctions in Solid Solutions of  $GaP_xAs_{1-x}$ "

V sb. Materialy dokl. V nauchno-tekhn. konferentsii Kishinevsk. polit-ekhn. in-ta (Material from Reports of the V-th Scientific-Technical Conference of the Kishinev Polytechnical Institute -- Collection of Works), Kishinev, 1969, p 120 (from RZh-Elektronika i yeye primeneniye, No 1, Jan 70, Abstract No 1B213)

Translation: The gas transport method of growth in a flow system assures preparation of epitaxial layers of solid solutions of  $GaP_xAs_{1-x}$  of various compositions and types of conductivity. Various structures with homo- and heterojunctions in solid solutions of  $GaP_xAs_{1-x}$  were prepared. On a base of epitaxial layers of the solid solutions  $GaP_xAs_{1-x}$  of constant composition, with p-n junctions, emitting diodes in the visible region of the spectrum were prepared. On layers of a

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variable composition with p-n junctions, photocollectors and position-sensing elements were prepared with a region of high sensitivity in a wide interval of photon energies of 1.3 e.v. and above. The basic characteristics of the devices prepared are cited and discussed.

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USSR

UDC 621.375.9

DOROGAYA, L. N., ZIMOKOSOV, G. A., LEIKIN, A. Ya., RATNER, A. M.,  
SOLOV'YEV, V. S.

"Simple Method of Operative Measurement of the Angular Divergence of a  
Laser"

Moscow, Izmeritel'naya Tekhnika, No 4, 1973, pp 30-31

Abstract: A method is described for measuring the angular divergence of the emission of a continuous-action laser based on transformation of the divergence of the laser beam by a prism. The theoretical basis for the method is presented, and the parameters of the device are calculated. The possibility of using the method for the pulse-action laser is investigated.

The described method was used to measure the angular divergence of the LG-56 helium-neon laser with a wave-length of 0.63 microns. A prism with its base in the form of an equilateral right triangle was rotated by an electric motor with a frequency of 7.2 hertz. The receiver was the FAU-68 photomultiplier defined by a slit, the width and position of which were regulated by screws. The signal was transmitted from the photomultiplier to the S1-19 oscillograph. On synchronizing the scanning with the rotation frequency of the prism,  
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USSR

DOROGAYA, L. N., et al., Izmeritel'naya Tekhnika, No 4, 1973, pp 30-31

clear pulses were observed on the oscillograph screen which reproduced the radiation pattern. With low pumping when only the basic transverse oscillation was observed visually in the near field, the shape of the pulse approached a gaussian curve. The halfwidth of the pulse recalculated for angles was  $6' \pm 30''$ , which agrees with the angular divergence of the basic mode field of  $5'24''$  calculated by the well-known formulas. With an increase in the pumping current strength, when the higher transverse modes were visually observed, the pulse on the oscillograph screen revealed a corresponding broadened structure. The shape of the pulse does not depend on the linear width of the slit  $d$  or its position  $\bar{c}$  in the region corresponding to a resolution of less than  $2'$ .

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1/2 023  
UNCLASSIFIED  
TITLE--EXTRACTION AND PHOTOMETRIC DETERMINATION OF ZINC IN ERYTHROCYTES  
-U-  
AUTHOR--(03)-KISH, P.P., ZIMOMRYA, I.I., MIZUN, P.G.  
COUNTRY OF INFO--USSR  
SOURCE--LAB. DELO 1970, (3), 155-7  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--PHOTOMETRIC ANALYSIS, ZINC, ERYTHROCYTE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3005/0429  
CIRC ACCESSION NO--AP0132654  
STEP NO--UR/9099/70/000/003/0155/0157  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE---04DEC70

CIRC ACCESSION NO--AP0132654

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE METHOD IS BASED ON THE REACTION OF (ZNCNS SUB4)PRIME2 WITH I AT PH 3.5-8.0. THE BLUE COMPLEX FORMED WAS EXTD. WITH C SUB6 H SUB6-BU SUB3 PO SUB4 (28:1) AND THE ABSORBANCE DETD. AT 610 MMU. THE REAGENT IS STABLE IN THE PRESENCE OF ACIDS AND ITS WATER SOLN. CAN BE STORED FOR A LONGER TIME. BY USING I, ZN CAN BE DETD. DIRECTLY IN ERYTHROCYTES IN THE PRESENCE OF FE, MN, CO, NI, CU, CD, HG, AND CR; PRELIMINARY SEPN. IS NOT REQUIRED. FACILITY: UZHGOROD. UNIV., UZHGOROD, USSR.

UNCLASSIFIED

USSR

RAKHIMDZHANOV, A. R., Professor, ASKAROV, Sh. A., and ZILON, T. S., Department of Neuropathology, Tashkent Institute for the Advanced Training of Physicians

"Polyneuritis in Chlorophos Poisoning"

Tashkent, Meditsinskiy Zhurnal Uzbekistana, No 5, 1971, pp 67-69

Abstract: Three cases of intoxication with chlorophos (dipterex-a cholinesterase inhibitor) are described. Two young girls drank it with suicidal intent and a 34-year-old male drank it unintentionally. All 3 developed the characteristic symptoms of acute poisoning with nausea, vomiting, and unconsciousness. Polyneuritis began to be manifested 6, 16, and 24 days after ingestion of the insecticide. Pain appeared in the gastrocnemius. Weakness developed in the lower legs and feet and, in one case, in the hands. The achilles tendon and patellar reflexes were absent. Two patients experienced hyperesthesia in the feet and lower legs. Treatment with vitamins, stimulants, physical methods, exercise, and massage resulted in improvement but not complete recovery. One case is described in some detail.

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USSR

ZIMONT, S. L., MAR'YASHKIN, N. Ya.

"Method of Numerical Integration for Calculation of Electron-Electron Repulsion Integrals"

Algoritmy i Algoritmich. Yazyki [Algorithms and Algorithmic Languages -- Collections of Works], No 5, Moscow Acad. Sci. USSR Computer Center, 1971, pp 18-23, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V547 by the author's).

Translation: A method is suggested for numerical integration of two-electron distribution functions using an interpolation formula in a four-step interval. The area of integration is divided into sectors, within which a net of nulls of Legendre polynomials is used.

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ZIMONT, S. L., MAR'YASHKIN, N. Ya.

"Klebsh-Gordan Coefficients"

Algoritmy i Algoritmich. Yazyki [Algorithms and Algorithmic Languages -- Collection of Works], No 5, Moscow Acad. Sci. USSR Computer Center, 1971, pp 15-17, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V545 by the author's).

Translation: An algorithm is suggested for calculation of any non-zero coefficient  $C_{l,j,2j}^{m+1} - l-j$ .

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USSR

ZIMONT, S. L., MAR'YASHKIN, N. Ya.

"Coefficients of the Transformation of a Slater-type Wave Function to a New Center"

Algoritmy i Algoritmich. Yazyki [Algorithms and Algorithmic Languages -- Collection of Works], No 5, Moscow Acad. Sci. USSR Computer Center, 1971, pp 9-14, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V548 by the author's).

Translation: An algorithm is suggested for calculation of the coefficients of the expansion of a Slater wave function with respect to attached Legendre polynomials to a new center. The algorithm calls for both calculation of the coefficients with fixed quantum numbers  $n$ ,  $l$  and  $m$ , and calculation of the full set of coefficients in the expansion of all functions of this center.

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USSR

UDC 536.46:662.61

ZIMONT, V. L., IVANOV, V. K., and OGANESYAN, S. KH.

"Self-Ignition and Combustion Cutoff in a Stagnation Zone During Flow About a Two-Dimensional Protection or Indentation by a Supersonic Fuel-Mixture Stream"

Moscow, Goreniye i Vzryv--Sbornik (Combustion and Explosion--Collection of Works), Nauka, 1972, pp 386-391 (from Referativnyy Zhurnal--Aviatsionnyye i Raketnyye Dvigateli, No 2, 1973, Abstract No 2.34.23. Resume)

Translation: On the basis of the heat mechanism and a gas-dynamic flow model are discussed the critical conditions of combustion cutoff in a stagnation zone formed during the flow of a fuel mixture about a projection and an indentation. The critical conditions of self-ignition are investigated on the basis of the heat mechanism and the chain mechanism. The experimental results of an investigation of mass exchange in such stagnation zones are presented for streams with a Mach number of 2.5. Comparisons of the calculated volume with an experimental one are presented, together with examples of numerical calculations of critical conditions for hydrocarbon-air and hydrogen-air mixtures. 3 figures, 9 references.

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USSR

UDC 662.61:536.248

ZIMONT, V. L.

"Theoretical Study of Diffusion Combustion of a Turbulent Stream Considering Pulsations in Concentration"

Teoriya i Praktika Szhiganiya Gaza [Theory and Practice of Combustion of Gas -- Collection of Works], No 5, Leningrad, Nedra Press, 1972, pp 90-105 (Translated from Referativnyy Zhurnal, Aviatsionnye i Raketnye Dvigateli, No 12, 1972, Abstract No 12.34.12, from the Resume).

Translation: A plan is studied for calculation of diffusion combustion of a free stream, allowing the averaged profiles of concentration, temperature and velocity to be determined, as well as profiles of the pulsation components: probability density of instantaneous concentration, mean square pulsations of temperature, concentration and their correlation. The calculation plan is based on integral methods. Calculations utilize three empirical constants: the turbulent Schmidt number and two effective coefficients of diffusion -- the summary and accelerated molecular coefficients. 3 Figures, 10 Biblio. Refs.

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USSR

~~ZIMONT, V. L.~~

"Experimental Investigation of the Mixing of Isothermal and Nonisothermal Turbulent Nozzle Wakes"

V sb. Turbulentn. techeniya (Turbulent Flows -- Collection of Works), Moscow, "Nauka," 1970, pp 138-144 (from RZh-Mekhanika, No 1, Jan 71, Abstract No 1B431 by author)

Translation: The author presents experimental data from the investigation of turbulent diffusion in a Laval nozzle, obtained by studying the mixing of a slightly heated jet fed coaxially to the main stream in the subsonic portion of the flow. It is shown that in experiments the coefficient of turbulent diffusion does not vary along the nozzle. The results of the investigation of the mixing of nonisothermal coaxial jets in contracting nozzles showed the presence of additional flow turbulization in pressure-gradient flow, due to the appearance of transverse velocity shift. For a quantitative description of the mixing process in channels of varying area a characteristic is suggested which is a generalization of the dispersion used to describe the mixing in free jets.

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USSR

UDC 631.954:631.811:633.63:632.51

KOROLEV, L. I., GULIDOV, A. M., ZIMOVSKAYA, A. T., and NEPOCHATOV, A. P.,  
Scientific Research Institute of Fertilizers and Insectofungicides, Moscow

"Herbicidal Activity and Selectivity of Preparations on Sugar Beets and  
Weeds as a Function of the Conditions of Mineral Supply"

Moscow, Agrokhimiya, No 4, Apr 73, pp 114-121

Abstract: Experimental results are reported from the study of the phytotoxicity of herbicides as a function of the nutritional conditions in sugar beets and weeds. Both greenhouse and field trials have shown a change in the reaction of sugar beets and various weeds towards the dichlorourea, eptam (S-ethyl N,N-dipropylthiocarbamate), tillam (S-propyl N-butyl-N-ethylthiocarbamate), pyramine (1-phenyl-4-amino-5-chloropyridazone-6) and murbetol, depending on the amounts of mineral fertilizers added. Significant differences in the content and breakdown of nutritional agents have been noticed in case of bristly foxtail grass treated with dichlorourea, directly related to the level of fertilizers. It has been shown possible to increase herbicidal effectiveness by regulating the supply of minerals.

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Zimovskiy, Yu. F.

SO: JPRS 55015  
25 JAN 1971

UDC: 616-036.865/866(047)"1966-1970"  
NEW BOOK ON EXPERT MEDICAL DETERMINATION OF DISABILITY  
[Book\* review by Yu. F. Zimovskiy, candidate of medical sciences (Moscow); Moscow, Sovetskoye Zdravoohraneniye, Kuzbass, No 12, 1971, pp 81-83]

The preparation and publication of methodological letters and instructions is one of the forms of adopting the results of scientific research in practical work. In this respect, of some interest is the knowhow of the Central Scientific Research Institute for Expert Determination of Disability and Organization of Work for Disabled Persons (TsITIN) which, for a number of years, has been regularly publishing methodological letters on various issues pertaining to medical disability expertise, in order to aid the VPK [Medical Commission for Determination of Disability] physicians and therapeutic institutions. This sizable and needed work helps improve the quality of selecting patients to appear before the VPK, the accuracy of expert evaluation of their condition, and in determination of vocational recommendations, etc.

We reviewed 23 methodological letters published in the last five years (1965-1970) in the form of individual pamphlets 1-2 printer's sheets in size each. They deal with expert determination of disability and job placement for patients with various neuropsychic diseases (9 letters), pathology of internal organs (4), sequelae of fractures (1), pulmonary tuberculosis (3), and oncological pathology (1). Some of the letters deal with methodological (2) and organizational matters (3).

These letters are based on extensive factual material and many years of knowhow accumulated by the institute and the authors. They discuss the most timely and complex issues in expertise of such diseases as postinfluenzal lesions of the nervous system (authored by G.A. Shukimovich and V.N. Shcherbakova), cervical osteochondrosis (K.A. Shukimovich and T.A. Silykha), diencephalic disorders (V.G. Korchagina), epilepsy (Ye.S. Mazonova and D.Ye. Melnikov), chronic alcoholism (S.A. Shubina and G.S. Vorontsova), bronchial asthma (O.V.

Methodicheskoye Pismo po Vrachebno-trudovoy Ekspertize (Kratkiy Obzor Izdaniy TsITIN za 1965-1970) [Methodological letters on Medical Occupational Expertise (Brief Survey of TsITIN Publications in 1965-1970)].

Medicine

USSR

UDC 621.318

Engineers DENISOV, A.G., ZINAKOV, V.K., PASHEV, V.A.

"Magneto-Controlled Contacts--Contemporary Switching Elements"

Moscow, Pribory i sistemy upravleniya, No 11, Nov 1971, pp 13-15

Abstract: The paper shows the basic advantages of magneto-controlled sealed contacts (MC) as compared with electromagnetic and semiconductor switching elements, the principles of their operation, the basic parameters (including those of five native MC), the construction of MC with dry contacts and contacts wetted by mercury, and the basic trend of growth. 3 ref. 3 fig. 3 tab.

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USSR

UDC 621.318.5

Engineers DENISOV, A.G., ZINAKOV, V.K., SHAPIRO, A.M.

"Certain Problems Of Application Of Magneto-Controlled Sealed Contacts"

Moscow, Pribory i sistemy upravleniya, No 11, Nov 1971, pp 18-20

Abstract: The paper lists various applications of magneto-controlled sealed contacts (MC) which include signaling and protection circuits, telephone switching apparatus, computers, and domestic equipment such as refrigerators. Various spark-quenching circuits used to increase the lifetime of MC are discussed; the circuits are based on the use of RC elements, semiconductor diodes, semiconductor variable resistances (varistors), and silicon stabilitrons. MC are often used in conjunction with low-power transistors and integral circuits; the peculiarities are discussed of MC which appear in a regime of switching very small voltages and currents and which must be considered in planning such apparatus. It is concluded that MC are extremely promising switching elements and a rapid increase of their output and an expansion of their sphere of application must be expected in the coming years. Progress in this field will considerably accelerate development and the introduction into series production of functional modules constructed on the basis of MC. A thorough study of the properties of MC makes it possible to avoid errors during planning of apparatus using them and to recognize new possibilities for their use.

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USSR

UDC: 681.121+551.571:665.61

GABDULLIN, T. G., YERMOSHIN, Yu. A., ZINATULLIN, F. L., MUSINA, R. G.

"A Depth Instrument for Simultaneous Measurement of Flowrate and Moisture Content"

Tr. Tatar. n.-i. i proyekt. in-t neft. prom-sti (Works. Tatar Scientific Research and Planning Institute of the Petroleum Industry), 1971, vyp. 20, pp 318-328 (from RZh-Metrologiya i Izmeritel'naya Tekhnika, No 6, Jun 72, Abstract No 6.32.581)

Translation: It is shown that a combination instrument which provides for simultaneous measurement of discharge rate and moisture content in a water-petroleum mixture separately by strata is needed when determining the point of leakage into a well. A description is given of the device, the principle of action, and the results of laboratory and industrial tests of the combination instrument. The influence of principal factors on measurement results is determined on the basis of the laboratory tests, and a procedure is given for taking these factors into account when making deep measurements. Five illustrations, one table, bibliography of six titles.

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USSR

UDC: 662.215.1

ZINCHENKO, A. D., SMIRNOV, V. N., CHVILEVA, A. A., Chelyabinsk

"Measurement of Electrical Conductivity of Explosion Products During Detonation of a Cast Charge of TG 40/60"

Novosibirsk, Fizika Goreniya i Vzryva, No 3, 1971, pp 422-426.

Abstract: The conductivity of a detonation plasma was measured by two methods: MHD and an electric contact method. The former method is used for the first time for the investigation of a dense plasma ( $\rho = 2-3\text{g/cm}^3$ ). The results of measurement by the two methods agree. The mean specific conductivity of the plasma at 2.4 mm from the origin of the detonation wave was 9.3 mho/cm. The volt-ampere characteristics produced by the MHD method contain a threshold voltage. The threshold voltage depends linearly on the intensity of the magnetic field applied. The mechanism of development of the threshold voltage cannot be determined from the available experimental results. It can only be assumed that the appearance of this effect results from peculiarities of the near-electrode layers in the presence of the magnetic field.

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USSR

UDC: 620.178.38

STRIZHALO, V. A., ZINCHENKO, A. I., MOROZOV, B. S., IL'IN, A. A., Kiev, Kaliningrad

"Study of Low-Cycle Fatigue of Titanium-Based Alloys at -196° C"

Kiev, Problemy Prochnosti, No 7, Jul 73, pp 49-53.

Abstract: The regularities of deformation and rupture of light alloys based on titanium with repeated low-cycle loading are studied under conditions of room temperature (20° C) and low temperatures (-196° C). The change in resistance of the alloys to cyclical loading upon transition to the low temperature is studied in the range of durabilities corresponding to quasi-static and fatigue rupture. The VT1-0, VT5-1 and VT6S alloys were used in the study.

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USSR

UDC 620.178.37

STRIZHALO, V. A., ZINCHENKO, A. I., (Kiev)

"Installation for Study of Low-Cycle Fatigue of Alloys at Cryogenic Temperatures"

Kiev, Problemy Prochnosti, No 8, 1972, pp 101-104.

Abstract: An installation is described for studies of the strengths of materials under low cycle repeated-static extension in the temperature range between +20 and -269°C. The installation consists of a test machine (type UME,  $\pm 10$  t), plus a low temperature attachment including a specimen clamping and loading system, system for measurements and recording deformations and forces and a helium cooling system.

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USSR

UDC: 681.3

ZINCHENKO, A. M., LENCHUK, V. S.

"Operator's Panel for Work in a 'Man-Computer' System"

V sb. Primeneniye tsifr. vychisl. mashin dlya obuch. programmir. (Use of Digital Computers for Instruction Programming--collection of works), Kiev, 1970, pp 147-151 (from RZh-Kibernetika, No 7, Jul 71, Abstract No 7V698)

[No abstract]

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USSR

UDC: 63: 31: 632.954

ZINCHENKO, V. A., ZINCHENKO, A. P., Ramensk Agrochemical Experimental Station,  
Moscow Oblast

"Statistical Analysis of Dependence of the Effect on the Doses of Physiologically  
Active Substances"

Moscow, Agrokimiya, Vol 6, 70, pp 105-111

Abstract: A variant of statistical analysis of the relation between the doses of phenazone in the soils and the decrease of the weight of the oat plants as bioindicators is suggested. The equation relating the logarithms of the doses with the probits of decrease of the weight of the plants is as follows:  $y = 4,844 + 1,213x$ , where:  $y$  is the probit of percentage decrease of the weight,  $x = \lg$  of the doses, and 1,213 - a coefficient of regression. With this equation the values of some distant probits permit determination of the values of  $x$  and construction of the line of regression. The zone of its significance is calculated from the formula of the error:

$$E = t \sqrt{\frac{y^2 - (\frac{\sum y}{n})^2}{n(n-2)}} (1 - R^2), \text{ where } t \text{ may be found from}$$

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USSR

ZINCHENKO, V. A., and ZINCHENKO, A. P., Agrokimiya, Vol 6, 70, pp 105-111

the student's table. Determination of the amount of the physiological active substances in soil may be easily calculated from the equation if the probit of percentage weight decrease is known from the experiment.

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1/2 049 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--DETERMINING IONOSPHERIC EFFECTS ARISING DURING THE PROPAGATION OF  
RADIO WAVES FROM SPACED POINT REGISTRY OF THE FARADAY AND DOPPLER  
AUTHOR--(05)--MISYURA, V.A., KROKHMALNIKOV, YE.B., ZINCHENKO, G.N.,  
BIRYUKOV, G.A., GRIDIN, A.N.  
CCOUNTRY OF INFO--USSR  
SOURCE--MOSCOW, GEOMAGNETIZM I AERONOMIYA, VOL X, NO 3, 1970, PP 428-434  
DATE PUBLISHED-----70  
SUBJECT AREAS--ATMOSPHERIC SCIENCES, NAVIGATION, MISSILE TECHNOLOGY  
TOPIC TAGS--RADIO WAVE PROPAGATION, IONOSPHERIC DISTURBANCE, GEOPHYSIC  
ROCKET, RADIO TRANSMITTER, DOPPLER EFFECT, FARADAY EFFECT, COHERENT  
SIGNAL  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3005/0549 STEP NO--UR/0203/70/010/003/0428/0434  
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UNCLASSIFIED

2/2 049

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--APG132735

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THIS PAPER DESCRIBES A METHOD FOR DETERMINING THE EFFECTS ARISING DURING RADIO WAVE PROPAGATION IN THE IONOSPHERE. THE AUTHORS GIVE INFORMATION ON VERTICAL IONOSPHERIC REFRACTION, IONOSPHERIC CORRECTIONS FOR THE OPTICAL AND GROUP PATH AND CORRECTIONS FOR THE DOPPLER SHIFT IN THE FREQUENCY OF COHERENT RADIO WAVES EMITTED BY TRANSMITTERS CARRIED ON GEOPHYSICAL ROCKETS. MORNING MEASUREMENTS WERE MADE AT FREQUENCIES OF 48 AND 144 MC-SEC IN SEPTEMBER AND OCTOBER 1965 IN THE MIDDLE LATITUDES OF THE SOVIET UNION FROM THREE STATIONS LOCATED SIMILAR TO 200 KM FROM THE ROCKET LAUNCHING POINT. THE RESULTS OF MEASUREMENTS OF THE REDUCED PHASE DIFFERENCE AND THE REDUCED DIFFERENCE IN DOPPLER FREQUENCY SHIFTS, AS WELL AS THE ROCKET SIGNAL FARADAY EFFECT AT TWO COHERENT FREQUENCIES, ARE GIVEN.

UNCLASSIFIED



1/2 039 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--MEASUREMENT OF IONOSPHERIC PARAMETERS FROM THE DOPPLER AND FARADAY  
EFFECTS OF COHERENT SIGNALS FROM GEOPHYSICAL ROCKETS RECORDED AT WIDELY  
AUTHOR--(05)--MISYURA, V.A., KROKHMALNIKOV, YE.B., ZINCHENKO, G.N.,  
FIRSAKOV, A.S., SLUTSKER, S.M.  
COUNTRY OF INFO--USSR

SOURCE--GEOMAGNETIZM I AERONOMIYA, VOL. 10, NO. 2, 1970, P. 244-249

DATE PUBLISHED-----70

SUBJECT AREAS--ATMOSPHERIC SCIENCES, MISSILE TECHNOLOGY

TOPIC TAGS--GEOPHYSIC ROCKET, VERTICAL PROFILE, IONOSPHERE, IONOSPHERIC  
STATION, ELECTRON DENSITY, DOPPLER EFFECT, FARADAY EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FAME--1997/0145

STEP NO--UR/0203/70/010/002/0244/0429

CIRC ACCESSION NO--AP0119141

UNCLASSIFIED

2/2 039

CIRC ACCESSION NO--AP0119141

UNCLASSIFIED

PROCESSING DATE--20NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. APPLICATION OF A DIVERSITY  
RECEPTION TECHNIQUE TO THE DETERMINATION OF VERTICAL ELECTRON  
CONCENTRATION PROFILES, HORIZONTAL GRADIENTS, AND THE INTEGRAL ELECTRON  
CONTENT IN A VERTICAL IONOSPHERIC COLUMN AT HEIGHTS ON THE ORDER OF 500  
KM. THE PARAMETERS OBTAINED ARE COMPARED WITH SIMULTANEOUS IONOSPHERIC  
SOUNDING DATA OBTAINED AT SEVERAL IONOSPHERIC STATIONS LOCATED AT  
DIFFERENT POINTS AROUND THE LAUNCHING SITE.

UNCLASSIFIED

Rare Metals

+1

USSR

UDC 546.664'24:621.317.412

PECHENNIKOV, A. V., KUPRIYANOV, B. A., CHECHERNIKOV, V. I., ABRIKOSOV, N. KH.,  
and ZINCHENKO, K. A., Moscow State University imeni M. V. Lomonosov, Institute  
of Metallurgy imeni A. A. Baykov, Academy of Sciences USSR

"Magnetic Properties of Dysprosium Tellurides"

Moscow, Neorganicheskiye Materialy, Vol 6, No 8, Aug 70, pp 1528-1529

Abstract: There is interest in a study of the magnetic properties of the r.e.m. Chalcogenides of the yttrium subgroup, most elements in which have a complex magnetic structure. The authors therefore studied compounds of dysprosium with tellurium:  $DyTe$ ,  $Dy_3Te_4$ ,  $Dy_2Te_3$ ,  $Dy_4Te_7$ ,  $Dy_4Te_9$ , and  $Dy_4Te_{11}$ . Measurement of the temperature dependence of magnetic susceptibility of dysprosium tellurides was performed using a pendulum balance in the 80-900°K temperature interval with a magnetic field intensity of about 10 koe. The investigations showed that the dependence of the inverse specific magnetic susceptibility on temperature is linear for all dysprosium tellurides. The results of the studies of the magnetic properties showed that these compounds have different electrical properties from metallic dysprosium and a significantly different nature of exchange interactions, indicating that the sf exchange interaction is significant in the formation of complex magnetic structures in the r.e.m.

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USSR

UDC 621.385.032.269

ZINCHENKO, M.S., LOPATIN, I.V. [Both names transliterated from Ukrainian]

"Experimental Investigation Of The Properties Of Beams Of High-Perveance Three-Electrode Electron Guns"

Ukr.fiz.zh. (Ukrainian Journal Of Physics), 1971, 16, No 6, pp 999-1004 (from RZh--Elektronika i yeye primeneniye, No 11, Nov 1971, Abstract No 11A26)

Translation: The results are presented of an experimental investigation of the properties of beams which are formed by 3-electrode guns with longitudinal compression. Measurements were made in a wide interval of changes of the gun parameters: potential, 100--1000 V; beam current, 2-50 ma; perveance, 2-130 microamp/v<sup>3/2</sup>; ratio of potentials of the first and second diaphragms, 1-18. As seen from the profiles of the electron beams presented in the work and the radial distribution of the current density at various cross sections of the beam, guns with longitudinal compression make it possible to control the location of the crossover, the form of the beam profile, the form of the curve of the radial distribution of the current density and the magnitude of the coefficient of beam sinusity during Brillouin focusing. It is shown that with control of the parameters mentioned, sufficient laminaity of the beam remains.

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